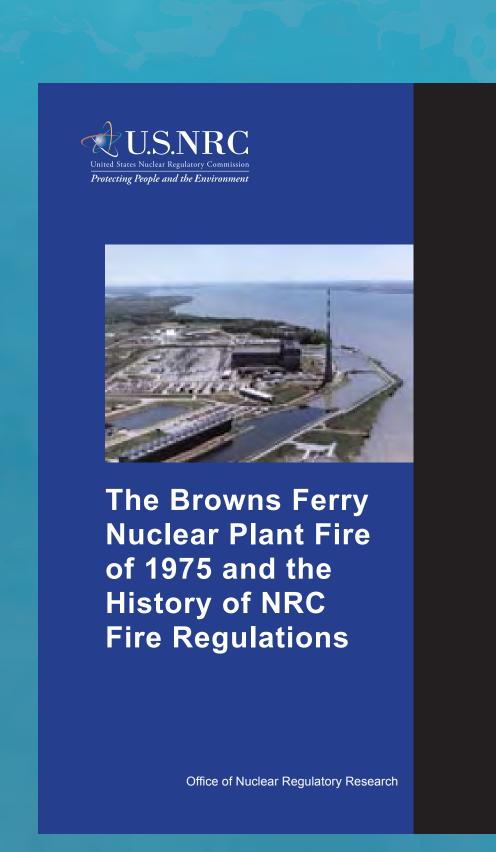


Office of Nuclear Regulatory Research

Fire Research

The Cornerstone of Fire Safety Regulation





Fire Modeling

Phenomena Identification and Ranking Table (PIRT)

World-class experts discuss fire model capabilities for resolving fire safety issues and to provide insights that will help guide the NRC's future fire safety research program. (NUREG/CR-6978 "A Phenomena Identification and Ranking Table (PIRT) Exercise for Nuclear Power Plant Fire Modeling Applications" Published November 2008)

Fire Model Users Guide

Provide guidance to assist users of fire models through real world nuclear power plant example scenarios. (draft report expected to be issued for public comment in mid-2009)

International Fire Research Cooperation (PRISME)—Organization for Economic Co-operation and Development (OECD)/ Institut de Radioprotection et de Sûreté Nucléaire (IRSN)

Collect real-scale data on electrical cable failure during fires, to further validate the CAROLFIRE-implemented THIEF submodel. (Part of the OECD-PRISME report expected in fall 2009)

Fire Testing

Spent Fuel Shipping Cask Fire Testing

Provide experimental data related to spent fuel shipping cask seal performance in beyond-design-basis fire events. (Small scale testing expected late 2009)

Cable Heat Release Rate and Flame Spread

Provide experimental data related to heat release rate and flame spread characteristics of bundles of electrical cables for fire modeling purposes. (ongoing)

Fire & Electrical Systems—Circuit Analysis

Direct Current Circuit Testing—DESIREE-FIRE

Previous testing focused on alternating current circuit response to fire; upcoming direct current testing will determine risk-significance of direct current circuit response to fire. (NUREG/CR expected late 2009)

Circuit Fire Testing Data Analysis

Improve estimates of how likely equipment will be to maloperate given fire damage to cables. (Fall 2009)

Cable Response to Live Fire—CAROLFIRE

Research on how NPP electrical cables fail when exposed to fire. This research included a tool developed by National Institute of Standards and Technology (NIST) to predict how long it will take nuclear power plant electrical cables to fail when exposed to fire. (NUREG/CR-6931, April 2008)



Collaboration with External Counterparts

Fire Research Branch collaborative partners include the National Institute of Standards and Technology, University of Maryland, Brookhaven National Laboratory, Sandia National Laboratories, Electric Power Research Institute,



Fire Probabilistic Risk Assessment & Human Reliability Analysis

National Fire Protection Association Standard 805 (NFPA—805) Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants

The NRC's Office of Nuclear Regulatory Research (RES) continues to provide training on NUREG/CR-6850 "Fire PRA Mechodology for Nuclear Power Facilities" and support for the frequently-asked-questions program. RES completed its support for the pilot plant observation visits. To date, 48 nuclear power plant units (at 31 sites) have submitted letters of intent to transition to NFPA 805 via 10 CFR 50.48(c). (On-going)

Fire Human Reliability Analysis

RES and EPRI are collaborating to develop a methodology and associated guidance for performing quantitative human reliability analysis for postfire mitigative human actions modeled in a fire probabilistic risk assessment. (draft report expected early 2009)

Risk Analysis on Red Oil Phenomena

BNL and RES are performing a risk analysis on the potential for a red oil hazard in the Mixed Oxide Fuel Fabrication Facility. The study will support the NRC's review of the license application of the facility. (Letter Report to NMSS, Early 2009)

Fire Research Knowledge Base Fire Research Knowledge Base

Data base of the NRC's public fire research documents. Introduced at RIC 2008 as an Excel-based program designed to help users find references quickly. (NUREG/BR expected mid-2009).

The Browns Ferry Nuclear Power Plant Fire of 1975:

History of the NRC fire safety regulations. Database, discussions, and explanation of public documents related to the Browns Ferry Fire of 1975 and the history of Appendix R to CFR Part 50. (NUREG/BR expected early 2009)

"Short History of NRC Fire Safety Research":

Covers the four phases of Fire Safety Research:

- 1. 1975–1987: The Fire Protection Research Program investigated the effectiveness of changes made to the NRC's fire protection regulations after the 1975 BFN fire
- 2. 1987–1993: Early fire probabilistic risk assessments were conducted
- 3. 1993–1998: Incremental improvements were made to the Risk Methods Integration and Evaluation Program
- 4. 1998-present: Methods were developed to better apply the Commission's PRA technology policy (where practical) to fire risk assessment. (NUREG/BR expected mid-2009))